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House Committee Votes Boost in NSF Funds

The House Committee on Science and Technology has provided the first indication that, at least as far as research and science education are concerned, Congress is not altogether in harmony with President Carter's budget-cutting drive.

The Committee's departure from the anti-spending bandwagon occurred April 17 as it completed work on an authorization bill that — in contrast to Administration plans — would give the National Science Foundation an increased budget of $1.028 billion for research and related activities and $92.2 million for science education. The amounts are for Fiscal 1981, which begins October 1.

In his revised "anti-inflation" budget last month, the President recommended only $992.8 million for NSF's research efforts and $75.7 million for its science-education programs. All totaled, the House measure, HR 7014, would provide the Foundation with $1.178 billion — compared to the Administration's $1.074-billion request.

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Not only did the lawmakers vote to increase NSF's overall authorization, they also established minimum funding levels for a half-dozen NSF-supported programs.

The House bill, for example, would provide "not less than" $19.4 million for Earthquake Hazards Mitigation; $1 million for the Small Business Innovation Program; $3 million for Research and Development in Appropriate Technology, and $5 million for a Center for Innovation Development (to be located in an area with unemployment rates above 10 per cent in 1979).

The Committee bill also would set a minimum of $1.8 million for the establishment and operation of three university-based Innovation Centers; $2.4 million for Science Faculty Improvement Programs (for year-long awards to science teachers involved in undergraduate education); $1.5 million for Science Education Programs relating to appropriate technology; and $2 million for faculty salaries at two- and four-year undergraduate institutions that do not have major research programs.

Only in three areas did the Committee go along with the President's request. Like the President's budget, the House bill would provide $259.8 million for Mathematical and Physical Sciences, $235.8 million for Astronomical, Atmospheric, Earth, and Ocean Sciences, and $59.8 million for Program Development and Management.

The Committee actually went below the President's revised request in one area. Under the House bill, the Ocean Drilling Program would receive $17.5 million — compared to the $22 million requested by the Administration. The cuts were expected to delay for at least one year the scientific use of the *Glomar Explorer,* the famous ocean-going vessel developed by the late Howard Hughes for use by the CIA in retrieving a sunken Soviet submarine. The original conversion of the ship to a research vessel was to have taken about 14 months; but NSF officials now estimate that it could take two years or more.

In most areas, the Committee took pains to provide more money than the President had requested.

For the US Antarctic Program, for example, the Committee would provide $61.4 million — $1 million

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In Brief

IBM Chief Scientist Lewis Branscomb and White House Science Adviser Frank Press are said to be leading prospects for succeeding Philip Handler as President of the National Academy of Sciences. Branscomb, former head of the National Bureau of Standards, has maintained closed interest in Washington policy affairs since joining IBM in 1972. Press has indicated that one term in the White House job is enough for him. Handler retires in June 1981.

Time Inc. *has made a go decision on the long-pending question of whether to publish a scientific magazine. Following extensive market tests, its entry in the fast-expanding field will come out next fall as a monthly, titled* Discover. *Meanwhile, the AAAS'* Science80 *is booming along with 400,000 subscribers, and has received board approval for switching from its every-other-month to a regular monthly schedule.*

Richard Atkinson, soon to leave the directorship of NSF for the top job at UC San Diego, doesn't share the official Administration line about science funds holding up quite well in Washington's budget-cutting spree. Atkinson has quietly been warning that inflation and spending limitations are going to hit research much harder than is generally realized.

. . .Next Test is in Appropriations Votes

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over the President's figure. For Biological, Behavioral, and Social Sciences, the Committee authorized $187.51 — $9.6 million above the Administration's request. For Engineering and Applied Science, the panel approved $142.56 million — $22.96 above the figure set by the President. For Scientific, Technological, and International Affairs, it recommended $30.45 million — $2.7 million over the Administration's figure. And for Cross-Directorate Programs, the Committee okayed $33.2 million — $3.45 million above the Carter recommendation.

Although Committee aides were still working on a report on the NSF bill last week, they said they did not expect the specific language of the measure to differ dramatically from current law.

Meanwhile, in a unanimous resolution, the Committee condemned Russia's exile of Andrei Sakharov. And it also called for a reduction, if not a complete elimination, of scientific travel and exchange, as a response to Soviet abuse of dissident scientists.

Earlier in the year, there had been talk of providing NSF with a two-year reauthorization, but the Committee decided, as it has in the past, to continue the practice of annual bills.

Many justifications exist for continuing the old tradition, but one which will probably have some appeal for science lobbyists is that lawmakers hope that next year's economy will not be as bleak as this year's. If things do improve on the economic front, lawmakers may feel justified in being more generous next year with NSF and other basic-research agencies. Whether that actually will be the case is impossible to predict. Mr. Carter has said inflation will climb by only about 9 per cent in fiscal 1981, but few share his optimism.

It is also too early to tell whether the appropriations committees in the House and the Senate will be eager to exceed the Administration's spending requests for NSF. The Science and Technology Committee, headed by Don Fuqua (D-Fla.), has always been fairly sympathetic to researchers' concerns, even when the rest of Congress has been hostile, or at best indifferent.

The first major test of the science budget, not just for NSF but for all of the agencies, will come in the next few weeks as both chambers finish work on the first-concurrent budget resolution — the measure that will set overall spending targets for the Congressional appropriations committees to follow in the months ahead. The budget committees have not been as generous with research and development as some of the agencies had hoped and there are some signs that cuts may occur on the floors of both chambers.

In the meantime, university lobbyists are continuing to hold up research and education as a major hope for boosting US productivity. Lawmakers have accepted the argument before, but whether they will buy it now that the going is getting rough is anyone's guess.—Anne Roark

(The author is an Assistant Editor of the *Chronicle of Higher Education.*)

Engineering Academy Council

Newly elected to the Council of the National Academy of Engineering: Solomon Buchsbaum, Executive Vice President, Bell Labs, and F. Karl Willenbrock, Dean, School of Engineering and Applied Science, Southern Methodist University. Relected for second terms: Arthur M. Bueche, Senior Vice President, General Electric, and Robert A. Charpie, President, Cabot Corporation.

UN Development Newsletter

Available without charge: Subscriptions to *Applications of Science and Technology to Development,* a newsletter published by the UN Office of Science and Technology. Address subscription requests to: Newsletter, Office of Science and Technology, United Nations Secretariat, New York, N.Y. 10017

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College Enrollments Can Be Kept Up, ACE Says

Colleges and universities can easily attract enough new students over the coming decade to offset the projected decline of 15 per cent in the 18-24 age group. That's the message of an optimistic new report by the American Council on Education.

Its primary purpose is to refute what the ACE calls the "conventional wisdom" that total enrollment is bound to fall during the 1980s. The study, directed by ACE chief economist Carol Frances, suggests a dozen "enrollment strategies" by which colleges and universities could not only make up for the fall in the traditional college-age population but actually end up with a small increase in student numbers by 1990.

"The study shows that we may have been far more pessimistic about the outlook for student enrollments than is justified," said Jack Peltason, President of the American Council on Education — the biggest higher-education association in Washington.

When the ACE portrays the conventional wisdom as "an enrollment decline widely estimated as high as 25 per cent in this decade," it is in fact exaggerating to make the optimism of its own study more striking. There have indeed been predictions of a 25 per cent decline, but they come from the more extreme pessimists. Actually the conventional wisdom, if it exists, is probably that total enrollments will slip by about 5 per cent during the 1980s and by slightly more during the 1990s — that was the view for example of the Carnegie Council on Policy Studies in Higher Education in its final report, published in January.

The new ACE study, titled "College Enrollment: Testing the Conventional Wisdom against the Facts," does not provide a single projection for student numbers in 1990. Instead it lists the 12 enrollment strategies and gives a figure by which each could increase student numbers.

"The importance of the many potential offsets to the projected declines in the 18-to-24 population have either been much too heavily discounted or overlooked altogether," said Frances. Again she was exaggerating; none of her strategies is really novel, and many have been discussed extensively by the higher-education community in recent years. But she may be correct in saying that universities have underestimated their potential for increasing enrollment.

For example, the study shows that if just three of the 12 strategies work out successfully on a national level, universities and colleges would gain 1.1 million full-time-equivalent students and end up with a total enrollment 3.5 per cent higher in 1990 than in 1980. Those three strategies call for:

• Enrolling 204,000 additional full-time foreign students. That would approximately double today's total, but Frances points out that during each of the past three decades, foreign enrollment in the United States has more than doubled, and she believes it is a realistic prediction. (For example, she maintains that there is still a huge pool of potential students in South-East Asia.)

• Enrolling an additional 481,000 adult students, by increasing college-going rates by one per cent and by taking advantage of the growth in the over-25 population.

• Enrolling 413,000 young people from lower- and middle-income families, by increasing the college-going rate at each income level to the rate at the income level $5000 higher.

Some of the study's other strategies for boosting enrollment include: increasing the participation rate for women under 35 to that of men (which would add 689,000 students); increasing student retention rates by a quarter (adding 225,000 students); increasing enrollment of people in industry (136,000), and enrolling

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Caltech, Bryn Mawr Link Up

Being the most selective undergraduate institution in the country, the California Institute of Technology can afford to take a snooty attitude to potential transfer students from other colleges and universities. Indeed it only accepts 20 to 25 of them a year.

However Caltech is currently in the process of negotiating a "3-2 program" with Bryn Mawr College, which would be the first such link it has formed since the early 1950s. It would allow students to spend three years at Bryn Mawr studying liberal arts and science, followed by two years' engineering at Caltech. They would emerge after five years with two degrees, a BA from Bryn Mawr and a BS in engineering from Caltech.

Caltech does not really want to increase its intake of transfer students, but it does want to enroll more women. Ten years after it went coeducational, its student body is still 84 per cent male. That's why it approached Bryn Mawr, whose undergraduates are still all women.

Bryn Mawr is itself a highly selective college — its freshmen have the highest average SAT verbal scores in the United States — and the Caltech link will be its first such arrangement with another institution. The college has responded favorably to Caltech's overtures because its administration wants to increase the number of women entering the engineering profession, where they are still greatly underrepresented.

'80s Agenda Study Sets Up Science Panel

To the extent that it's even bothered to take notice, official Washington has generally responded with indifference or skepticism toward one of the latest additions to the ranks of government study commissions — the President's Commission for a National Agenda for the Eighties.

But since there's a Science and Technology Panel among the nine panels that make up the commission, SGR has looked into the matter, and must report that it's all very curious, though surely quite harmless.

First of all, no one quite knows what to make of the Commission, because it is so big, unwieldy, and short-lived — 50 "commissioners," a staff of 20, and a December 31 reporting deadline — that it is difficult to see how it can accomplish anything useful. Add to this that it has acquired 11 US Senators and 15 Representatives as "advisors," and the prospect for a useful outcome seems even dimmer, especially in view of the stated assignment.

This was described October 24 at a White House press briefing by Hedley Donovan, the former Time Inc. mogul who was called in to help save Jimmy Carter's then-crumbling fortunes. Donovan said that "the President is appointing a commission of private citizens, nonpartisan, to examine problems, opportunities, challenges to the country in the 1980s, to report to the Presi-

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ENROLLMENTS *(Continued from Page 3)*

more minority students (74,000). These figures are "conservative" estimates, the ACE says.

To some extent the strategies overlap, and some will be particularly applicable to certain types of institution. The ACE is advising planners at the state or institutional level to use the framework offered by the report (which will be published in full in June) to generate their own projections. ACE President Peltason denies that the strategies are a recipe for lower academic standards.

The Council's principal reason for releasing the report is apparently a desire to give American higher education a psychological lift from its present mood of gloom about the future. In fact, there is a growing feeling that the many recent prophecies of an academic depression could be self-fulfilling.

This study does not look in detail at prospects for the 1990s, when the traditional college-age population will decline somewhat faster than in the 1980s. But Frances said similar strategies should be capable of carrying higher education through the 1990s, too, though it would be "a little harder" to prevent an enrollment decline then.—Clive Cookson

(The author is Washington correspondent for the London *Times Higher Education Supplement.*)

Who's on the Commission

Daniel Bell, Professor of Sociology, Harvard University
Robert Benson, President, Children's World, Inc., Author of *Counterbudget*
Charles Bishop, President, University of Houston System
Gwendolyn Brooks, Poet
J. Fred Bucy, Jr., President, Texas Instruments
Pastora San Juan Cafferty, Professor, School of Social Service Administration, University of Chicago
Joan Ganz Cooney, Children's Television Workshop
Marian W. Edelman, Director, Children's Defense Fund
Daniel Evans, President, Evergreen College
Frances Fitzgerald, Author
Herman Gallegos, Chairman, Human Resources Corporation
John Gardner, Chairman, Common Cause
Don Gevirtz, Chairman of the Board and CEO, Foothill Group, Inc., Los Angeles
C. Jackson Grayson, Director, American Productivity Center
Philip Handler, President, National Academy of Sciences
Dorothy Height, President, National Council of Negro Women
William Hewitt, Chairman, John Deere Co.
Ruth Hinerfeld, President, League of Women Voters
Carl Holman, President, National Urban Coalition
Benjamin Hooks, Chairman, NAACP
Matina Horner, President, Radcliffe College
Thomas Jorling, Professor of Environmental Science, Williams College
Rhoda Karpatkin, Executive Director, Consumers Union
Lane Kirkland, President, AFL-CIO
Juanita M. Kreps, Former Secretary of Commerce
Esther Landa, President's Advisory Committee for Women
Theodore Marmor, Professor of Political Science and Public Health, Yale University
Martin Marty, University of Chicago Divinity School
Michael McCloskey, Executive Director, Sierra Club
William McGill, President, Columbia University
William Miller, Partner, Steptoe and Johnson
Alan Morrison, Director, Public Citizen's Litigation Group
Bill Moyers, WNET, New York
Roger Noll, Professor of Economics, California Institute of Technology
Frank Pace, Jr., Chief Executive Officer, International Executive Service Corps
Edmund Pellegrino, President, Catholic University
Donald C. Platten, Chairman, Chemical Bank
Tomas Rivera, Chancellor, University of California at Riverside
Paul Rogers, Former U.S. Representative (D-Florida)
Elspeth Rostow, Dean, LBJ School of Public Affairs
Carl Sagan, Astronomer, Cornell University
Howard Samuels, Howard Samuels Enterprises, New York
Henry Schacht, President, Cummins Engine Company
William Scranton, North Eastern Bank
Beverly Sills, Director, New York City Opera
Lewis Thomas, Chairman, Sloan-Kettering Institute
Foy Valentine, Executive Director, Christian Life Committee, Southern Baptist Convention
Glen Watts, President, Communications Workers of America
Marina V. N. Whitman, Vice President and Chief Economist, General Motors Corporation
Addie Wyatt, International Vice President, United Food and Commercial Workers

. . .To Study Basic, Applied Science Ties

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dent December 31, 1980, after the election, . . . and to try and consider in a very broad gauge way the state of the country's possibilities in regard to a lot of our fundamental problems, including those we've been concerned about in the present tense, such as inflation, our energy productivity, but looking ahead to broader questions of social justice and economic vigor, innovation, the general temper and spirit of the country, the quality of life in the coming decade." And so on.

With William McGill, the retiring President of Columbia University, as chairman, the Commission has held two meetings and has set up its various panels — which bear the titles of: energy/environment; economy, science and technology; social justice; metropolitan/non-metropolitan areas; regulation; electoral process; quality of life, and world community.

As for science and technology: The chairman is Glenn Watts, President of the Communication Workers of America, and the members are: Charles Bishop, President of the University of Houston System; J. Fred Bucy, President of Texas Instruments; Frances Fitzgerald, book-writing journalist; Edmund Pellegrino, President of Catholic University; Carl Sagan, astronomer and science popularizer, and Lewis Thomas, Chairman of the Sloan-Kettering Memorial Cancer Center. (Philip Handler, President of the National Academy of Sciences, opted for membership on the energy/environment panel.)

Getting the science panel together has been a bit of a problem since Sagan is tied up with a film-making project, Thomas has been ill, and Bucy and Fitzgerald have been very busy.

As for staff, the crucial element in these matters, the Science and Technology Panel has done well by enlisting Gail Pesyna, a PhD chemist who formerly served with the House Science and Technology Committee and with the Office of Management and Budget, and Dennis Pirages, a PhD political scientist who directs the Program in Technology, Resources, and Political Economy at the University of Maryland.

What will the science and technology panel be talking about? A background paper raises some of the following items:

"Is there a need for better linkage between basic and applied research to reduce the time required for innovations?"

"Would it be desirable to heighten the incentives for industrial basic research activity?"

"In the field of biomedical research, is self-policing by industry feasible, in light of patent and profit measures?"

When Donovan discussed the Commission at that White House press briefing last October, he was churlishly asked by one of the seen-it-all regulars of the presidential press corps, "Do you think anything new is going to come out of this?" — adding that the 50 commissioners included "much the same old retreads" from prior big studies.

Donovan replied, "I have faith in human nature confronted with new situations."

NCI's Gori Takes New Job

Gio Gori, who was temporarily exiled from the National Cancer Institute in 1978 for suggesting that some cigarettes are safer than others, has a new job: Director of the Franklin Institute Policy Analysis Center, a newly established, Washington-based offshoot of the Franklin Research Center, which is the applied research division of the venerable Franklin Institute, of Philadelphia.

Gori was director of NCI's program to develop a safer cigarette when he ran afoul of then-HEW Secretary Joe Califano for stating in the *Journal of the American Medical Association* that the new low-tar, low-nicotine cigarettes appear to be less lethal than traditional-formula smokes. Califano and other anti-smoking zealots jumped on this assertion, and Gori quickly was off the Bethesda campus and sent on detached duty to study at Johns Hopkins (SGR Vol. VIII, No. 15).

The new Franklin center, with offices in Silver Spring, Md., will have an initial three-year budget of $1 million, according to an announcement, which says that the center "has been formed to analyze the impact of government and private policies, especially those involving technology, upon health and the quality of life."

NAM Cool to Innovation Plan

The National Association of Manufacturers has given what an NAM press release describes as "guarded support" to the Carter Administration's skimpy designs for boosting industrial innovation (SGR Vol. IX, No. 19).

Describing the proposals as the "beginning of a solution," Arthur L. Bolton Jr., Chairman of the NAM Science and Technology Committee, said the Carter plan is lacking in tax incentives to encourage industry to invest more in innovative activities. Bolton, Chairman of Bolton-Emerson Inc., of Lawrence, Mass., also made the standard industrial complaints about government regulations as an impediment to innovations.

Europe: EEC Settles Another Research Fight

London. The European Economic Community (EEC) has just come through another of those crises that invite wonder as to why anyone ever thought it would be a good idea to bring nine nations together to make collective decisions. Like the long fight over locating the Joint European Torus — the Common Market's British-based answer to Princeton University's Tokamak Fusion Test Reactor — the latest battle involved a research program.

This time it was the four-year program of the community's Joint Research Center (JRC) that caused the trouble. Essentially this involves the work of a handful of research laboratories operated by the EEC throughout Europe. By far the biggest of these is the JRC at Ispra, in Italy; and it was, in the end, a row between Italy and France that not only held up agreement over the JRC program, but also approval of the Common Market's fusion program. Thus, as has happened before, disagreement among members threatened progress on the JET project, and the scientists in charge of JET responded with dire warnings of impending disaster.

At the heart of the row between France and Italy was a nuclear safety project, and behind that row was another that had threatened to halt the EEC's R&D effort more than a decade ago.

When the EEC sought to approve the JRC's program in 1968 it proved impossible to reach agreement. For five years the members of the Community — Britain wasn't a member of the "Euroclub" then — limped along, funding the JRC's work from year to year. At the time there were moves to shut down the JRCs altogether, because of dissatisfaction with their performance, including an abysmal labor-relations record. Ispra was especially criticized, but Italy fought fiercely to save it. As a part of the compromise that ended the 1968-1973 crisis, Italy leased from the EEC the Ispra JRC's Essor reactor. Otherwise, Essor, which had been built as a prototype of a new type of reactor that the EEC members had abandoned as soon as the reactor was completed, would have been scrapped.

When the 1980-83 JRC program came up for discussion, Italy suggested that the EEC should use Essor as a reactor-safety test-bed. The Italians had already embarked on a project on Essor called Sara: now they proposed something called Super-Sara in the wake of the Three Mile Island accident.

Essentially the idea behind Super-Sara is to see what happens to reactor fuel elements in loss-of-coolant accidents like that at TMI. There was some objection, from Britain among others, that the project was too expensive. This complaint disappeared when Italy agreed to pay not only the cost of the hardware needed for Super-Sara, around $17 million, but also a contribution of nearly $10 million to the cost of the research program.

Italy's largesse did not convince the French, who complained that Super-Sara wasn't original because it repeated work going on elsewhere, including France. But the French then dropped their opposition. It is never quite clear what makes one EEC country suddenly abandon opposition to a proposal, since so many other factors, farm prices, for example, can get tangled up in negotiations. But one factor that probably swayed the French was support for Super-Sara from Japan and the US.

The Brussels Commission — the EEC's civil service — couldn't negotiate with outsiders before the Community members had approved the project, but it seems that non-EEC countries may cover up to a quarter of the cost of Super-Sara. The research is expected to cost $70 million in the four-year period covered by the program.

Agreement on Super-Sara finally cleared the way for approval of the $700-million JRC program and the EEC's $450-million contribution to the 1979-83 fusion program. (The EEC pays only part of the cost of the

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In Print

Ideology of/in the Natural Sciences, edited by British academics Hilary and Steven Rose, with an introduction by Ruth Hubbard, Professor of Biology, Harvard; contains 14 essays providing a "Marxist, new-left perspective" on science and technology; 363 pages, paperback only, available for $11.25 per copy, plus 59 cents postage, from: Schenkman Publishing Company, Inc., 3 Mount Auburn Place, Cambridge, Mass. 02138.

The Impact of Tax and Financial Regulatory Policies on Industrial Innovation, 34 pages, monograph derived from a workshop held in July 1978 by the National Research Council's Committee on Technology and International Economic and Trade Issues; available without charge from: Office of the Foreign Secretary, National Academy of Engineering, 2101 Constitution Ave. Nw., Washington, DC 20418.

Law & Science, a selected bibliography, 155 pages, third revision and first hardcover edition, contains 1776 entries under headings that include: law and social science, the law of computers, legal problems of privacy, and medicine and law. Compiled by Morris L. Cohen, Jan Steppan, and Naomi Ronen, of the Harvard Law School Library. MIT Press, $15.

R&D Support: The Rich Stay Rich, NSF Says

The National Science Foundation has just issued some illuminating, though slightly stale, statistics that verify the enduring concentration of the federal government's academic R&D spending in a relatively small slice of the nation's institutions of higher education.

In a report mainly concerned with figures for Fiscal 1978, NSF notes that in 1963 — when it started keeping score — "the leading 100 R&D-performing universities accounted for nearly 90 per cent of all Federal support for [academic] research and development; by 1978, the leading 100 R&D performers continued to be recipients of 84 per cent of all R&D funds."

NSF adds that "Of the 674 institutions receiving Federal R&D support in 1978, the leading 20 recipients represented, as in previous years, about two-fifths of all such funds." The Defense Department, the report continues, "concentrated 56 per cent of its R&D support among the top 20 research performers," and of that amount, over one-half was received by the Applied Physics Laboratory, which became an integral part of Johns Hopkins University in 1978. (These data are from publication NSF 80-303, available without charge from: Division of Science Resources Studies, National Science Foundation, 1800 G St. Nw, Washington, DC 20550.)

Academe's Top 40 in Federal Funding (FY 1978)

(dollars in thousands)

Rank	Institution	Total, all activities	Research and development	R&D rank
	United States Total	7,479,177	3,362,174	
1	Johns Hopkins Univ.	212,866	196,081	1
2	Mass Inst of Technology	130,586	114,021	2
3	Howard Univ.	116,195	5,715	6
4	Univ of Washington	105,671	76,080	5
5	Univ. of Wis-Madison	99,330	65,225	8
6	Univ of Cal-Los Angeles	97,779	69,595	6
7	Stanford Univ.	94,009	80,110	3
8	Univ of Minnesota	93,558	59,582	10
9	Harvard Univ	89,949	68,520	7
10	Univ of Cal-San Diego	88,508	77,033	4
	Total 1st 10 institutions	1,128,451	811,962	
11	Univ of Michigan	86,527	58,444	11
12	Columbia Univ-Main Div	84,941	64,687	9
13	Cornell Univ	79,729	58,258	12
14	Univ of Pennsylvania	78,350	56,138	13
15	Yale Univ	67,892	53,805	14
16	Pennsylvania State Univ	66,767	41,974	20
17	Univ of Cal-Berkeley	65,720	49,663	15
18	Ohio State Univ.	64,107	33,983	25
19	Univ of Chicago	61,262	48,984	16
20	Univ of Southern Cal	61,039	42,458	19
	Total 1st 20 institutions	1,844,785	1,320,356	
21	Univ of Cal-San Francisco	59,488	46,388	17
22	Univ of Ill-Urbana	58,840	42,947	18
23	New York Univ	54,905	38,235	22
24	Univ of Colorado	53,375	32,091	27
25	Washington Univ	56,162	41,974	21
26	Univ of Texas at Austin	47,701	37,232	23
27	Duke University	46,870	34,632	24
28	Univ of Rochester	46,653	33,616	26
29	Purdue Univ	44,383	29,554	28
30	Univ of NC at Chapel Hill	43,691	26,555	34
	Total 1st 30 institutions	2,352,853	1,683,580	
31	Michigan State Univ	43,666	21,792	42
32	Univ of Utah	42,863	29,352	29
33	Univ of Miami.	41,713	25,744	38
34	Univ of Pittsburgh	41,319	25,984	36
35	Univ of Arizona	39,534	25,828	37
36	Univ of Florida	38,751	21,464	44
37	Univ of Cal-Davis	38,476	27,721	32
38	Northwestern Univ	38,401	26,635	33
39	Inter Am UPR-San German	37,894	0	
40	Univ Alabama-Birmingham	37,552	21,466	43
	Total 1st 40 institutions	2,753,022	1,909,566	

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fusion program, which is expected to cost $1.1 billion.)

The new four-year package, which should have started on 1 January this year, puts more emphasis on reactor safety projects than did the previous research program — the share of the total budget for this area goes up from 40 per cent to 50 per cent. Solar energy research is doubled to around $30 million.—MK

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In Quotes: Academe Going Broke on R&D

The following excerpts are from a talk, "Basic Research on the Campus: A University View," given April 15 at George Washington University by Steven Muller, President of Johns Hopkins University:

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Basic research quite simply has become so expensive that no university can execute it on any significant scale with its own resources. Worse than that, universities are no longer even in a position to do so on the traditional basis of cost sharing . . . While individual researchers are scattered in colleges and universities throughout the United States, the evolution in the scale and cost of basic research has long ago created the situation that the overwhelming bulk of it is carried on in only a tiny minority of this country's 3300 institutions of higher education. Perhaps a hundred campuses can lay claim to being major research institutions, and in truth, less than 50 or 60 produce high quality basic research in large volume. The plain fact is that these institutions can no longer afford to subsidize basic research activities adequately with their own resources, even if unlimited federal support were available but awarded according to present patterns. . .

The only thing that makes sense is for the federal government to continue to look to the major research universities for the bulk of the nation's basic research effort, and to provide funding for this purpose.

Such funding would have to be permanent and substantial . . . In effect, the federal government would have to give explicit recognition to the obvious fact that a relatively small group of major research universities already constitute the resource base for most basic research, and need to be identified as national research institutions for this purpose . . . The really important factor would be a durable federal commitment to assume the full burden of basic research at [selected] university campuses, which explicitly means funding equivalent to endowment support in addition to annual grants.

This, of course, is not really a farfetched notion. When the federal government awards grants for building construction or largescale instrumentation, the effect is already that of a permanent commitment. What needs to be added is an equivalent permanent funding for the maintenance of the facility, the maintenance and replacement of equipment, and core operating personnel . . . Permanent funding for core personnel . . . is not likely to be handled effectively by stationing federal personnel on the campus. Here the traditional model of providing funding to the institution to recruit and deploy the personnel seems to be the only viable approach. The required differences would be the need for a permanent grant to enable the university to do so. This in turn requires recognition that education in advanced science is an inextricable part of the basic research mission. . .

Bateman Succeeds Deutch

Worth Bateman, a veteran of various government and close-to-government bureaucracies in Washington, has been appointed Acting Under Secretary of the Department of Energy, succeeding John Deutch, who resigned to return to MIT. Bateman was formerly with HEW and the Urban Institute, has been with DOE since its founding in 1977, and was Acting Deputy Assistant Secretary for Energy Technology immediately prior to his new appointment.

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